Interpreting Architectural Variation at the Wildcat Site in Dayton, Ohio

A Senior Honors Thesis

Presented in Partial Fulfillment of the Requirements for graduation
with research distinction in Anthropological Sciences in the undergraduate colleges of The Ohio State University

by

Emily Coate

The Ohio State University
December 2009

Project Advisor: Dr. Robert A. Cook, Department of Anthropology

Abstract

"Fort Ancient" is a term used by archaeologists to designate the material remains of a people who flourished along the middle Ohio River Valley and its tributaries between A.D. 1000 and 1670. Much is known about larger Fort Ancient villages, but very little attention has been given to smaller sites. This project examines a small archaeological site in Dayton, Ohio known as Wildcat (33My499) with the purpose of understanding its architectural layout and variation. It focuses on structural features, namely postholes, and their chronological and spatial relationships. A variety of posthole attributes reveals distinct structural forms within the site. Consideration of radiocarbon dates and diagnostic artifacts suggests the settlement may have been reoccupied or may have grown over time. It is possible that the inhabitants were one corporate group who expanded the breadth of the site as they grew in number. However, additional analysis is needed to further examine this issue.

First a brief introduction to the Fort Ancient culture, including pertinent data from other relevant Fort Ancient sites is examined. This is followed by an overview of the Wildcat site. Finally, after describing the methodology employed, results are presented. Limitations in the evidence preclude definitive interpretations, but some hypotheses are forwarded for future testing.

Acknowledgments

It has been an honor and privilege to work with many intelligent, focused, driven and generous people throughout this undertaking. This project would not have been possible without the support of numerous people, to whom I am exceedingly grateful.

First, my sincere gratitude to my advisor, Dr. Robert Cook, whose unwavering commitment to helping his students has been a true inspiration. He patiently directed me through the ropes of excavation, laboratory analysis, conference presentations, grant writing, and, finally, developing my thoughts on paper. He has been a superb mentor, and working under his guidance greatly enhanced my undergraduate career.

In addition, I must also acknowledge my indebtedness to the other members of my committee, Dr. Richard Yerkes and Dr. Donald Terndrup, who offered numerous suggestions and revisions which greatly improved this thesis.

The data retrieved from the Wildcat site would not have been possible without the support from CEMEX, Inc. which generously allowed us to excavate the site owned by them. Gander Mtn., located next to the site, gave their encouragement and help by lending us supplies and shelter, and ignoring the mud we

occasionally tracked into the store. Special thanks go to The Ohio State University's Honors & Scholars Center Summer Research Internship Program for awarding me a grant which not only allowed me to continue participating in excavations at the site for a second year, but also paid for the dating of a radiocarbon sample.

Further thanks go to the other students involved in the Wildcat excavations for making the summer field schools a fun endeavor. Finally, my sincere appreciation to my family for allowing me to pursue study in a field I truly enjoy.

Fort Ancient Background

People of the prehistoric Fort Ancient culture inhabited the middle Ohio River Valley from A.D. 1000 to A.D. 1670. Settlements were built along the Ohio River drainages and its tributaries, where there was a renewable soil source for maize horticulture (Drooker and Cowan 2001). Subsistence consisted of agriculture, hunting of white-tailed deer and other animals, and gathering of wild plants (Cowan 1987). Fort Ancient settlements range in size from small hamlets of only a few structures to large, complex villages. Sites extend from southeast Indiana through southern Ohio and into eastern Kentucky and western West Virginia (Drooker 1997; Henderson and Pollack 2001) (Figure 1).

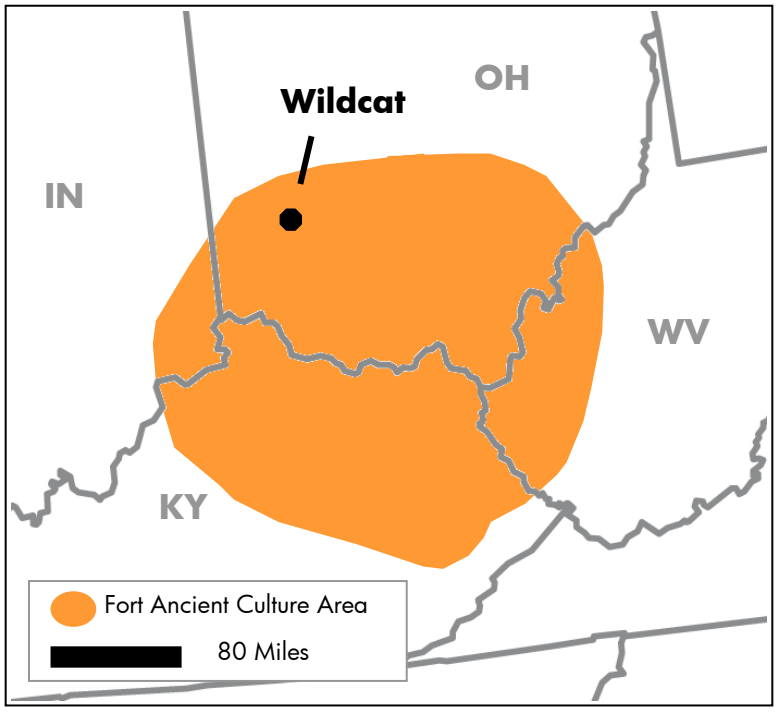


Figure 1: Boundaries of the Fort Ancient Culture Area. (Sources: U.S. state outline map courtesy of the U.S. Geological Survey; Culture Area based on Cook 2008: Figure 1.1)

The first large-scale analysis and synthesis of Fort Ancient culture was undertaken by James B. Griffin (1943). He noted sub-regional patterning in ceramic assemblages (Griffin 1943). After this early work, radiocarbon dating allowed the temporal framework to be refined. Today, Fort Ancient complexes are generally split into three time periods: Early (A.D. 1000-1200), Middle (A.D. 1200-1400), and Late (A.D. 1400-1750), which is also called the Madisonville Horizon (Sharp 1996). Settlements within the Early period were more often than not small in size. However, with an increasing dependence on maize and other domesticates, this changed over time, leading the Middle period to exhibit an increase in settlement size and social complexity. More substantial structures were built, along with organized layouts of the typical circular pattern with a plaza for community and ceremonial purposes (Henderson and Pollack 2001). By the Late Fort Ancient time period, many regional differences and local traditions abated, most likely due to greater interaction among Fort Ancient sites and neighboring contemporaneous groups (Cook 2008; Drooker 2007), as well as a more geographically restricted settlement pattern (Kennedy 2000). There is an accompanying increase of non-local materials at Fort Ancient sites and the development of a single ceramic style across the region (Pollack and Henderson 1992).

Most Fort Ancient settlements are arranged in a circular form, the center containing an open plaza area that was used for ritual or communal purposes

(Henderson and Pollack 2001). Within the settlement, differential spatial patterns between houses reflect social relationships. Clusters are separated on the basis of lineage, where related individuals are associated with houses spaced closer together. Larger ceremonial structures are often set apart from these lineal groups, and placed closer to the central plaza (Heilman et al. 1990; Cook 2008).

The relationship between larger villages and outlying hamlets is poorly understood, but a rigid system of inter-site hierarchical control among Fort Ancient villages is not evident. Any authority held would most likely have been by a prominent clan or group within the local community and is most clearly expressed through mortuary patterns (Heilman and Hoefer 1981). Excess resources were not heavily centralized, but maintained by individual households. This would reasonably have left smaller settlements to operate autonomously, provided they were located in a productive environment. Smaller sites that have been studied are most often interpreted as seasonal hunting camps or other resource procurement locations tied to the population of larger villages (e.g., Brose and White 1983; Essenpreis 1978). However, the possibility of small-scale hierarchies has also been forwarded as a possibility in some cases (e.g., Riordan 2000). Larger villages may have held a form of heterarchical control over smaller sites (Henderson and Pollack 2001; Simonelli and Kennedy 2003). Additional "homesteads" with only seasonal associations with larger villages may also be a possibility (Riordan 2000:420). With a social ordering based on kin relations, it is

also a distinct possibility that members of a growing village could have separated due to conflicts and formed smaller, fission groups, or that smaller settlements may have been preferred in order to maximize hunting capabilities (Ledbetter 1992:40).

Fort Ancient house types most commonly consist of single-post architecture in rectangular forms (Baby 1971). There are a variety of wall and roof construction methods supported by available data. Clay daub covered grasses and branch wattling is the most common wall form, with roofs of prairie grass and perhaps bark (Cook 2005) (Figure 2).

SunWatch, a quintessential circularly-arranged Fort Ancient settlement, is located on the west bank of the Miami River's main channel, around 16km south of the Wildcat site. Radiocarbon dates place the occupation between A.D. 1000 and A.D. 1500 with either one long use of the site between A.D. 1200-1300, or two shorter separate occupations (Cook 2007). The center of the open plaza is occupied by a substantial cedar pole. This has been interpreted as a ceremonial pole and marker of solar alignments (Heilman et al. 1990). Ethnographic data describe posts that "embodied supernatural forces, legends, social memories, and identities. And some or all may have been social persons…who were honored with offerings and prayers" (Pauketat and Alt 2005:228).

Figure 2: Photograph of reconstructed houses at SunWatch Indian Village, a Fort Ancient site in Dayton, Ohio. (Source: www.sunwatch.org.)

Structure arrangements often hold social significance, and give us an insight to the immaterial relationships which make a society. For example, houses grouped together are identified as kin groups, or corporate groups. In the case of SunWatch, different kin groups are identified based on spatial arrangements of houses and associated features (Cook 2008). One or two structures in some cases are closer to the central ritual post than others. These have been interpreted to be "founders" of the kin group; as the lineage grows additional structures are added nearby. Families at different stages of development have differing numbers of structures (Cook 2008).

A selection of smaller Fort Ancient sites is briefly described below, with relation to attributes critical for comparison to the Wildcat site.

Killen Site: Five sub-rectangular house structures were located near a burial mound at the Killen Site, along with several areas of burned daub and shallow refuse pits associated with the structures. These pits were located next to, but outside of, house walls. Two houses at the Killen site show evidence of a wall being rebuilt. Structures were arranged in a linear layout and range from 4.5-8m in width by 7-11.5m in length (52m^2 floor area). Postholes average 13cm in diameter and 15-25cm in depth and occur at a 30cm interval (Brose 1982).

Goolman Site: This site is interpreted as a winter camp, and includes a minimum of three structures. A large rectangular structure lies between two smaller oval ones. The oval structures contain central hearths. These smaller structures were interpreted as sleeping quarters for individual families, while the sturdier structure was interpreted as a communal activity area associated with the whole group of nuclear families (Turnbow and Jobe 1984). The authors also mention other interpretations for the variation in structures. The larger structure may have been the living quarters for the leader of the group, or instead from another time period entirely. There is no evidence of storage pits at the site, leading away from an interpretation of agricultural use (Turnbow et al. 1983). The

structures are smaller than those found at larger Fort Ancient villages, and as a result of their size would have been efficiently heated during the cold winter months (Turnbow et al. 1983:589-590). The smaller structures' postholes were placed 60-80cm apart, enclosing 10-15m^2 of living area. The larger structure in the center was constructed of larger poles set 1m apart and 9-16cm in depth, enclosing 20-24m^2 of living area. The authors estimated the population at 17 to 32 individuals (based on Brose et al. 1979).

Wilson: Excavation of this site revealed 74 postholes aggregated closely and in relation to a hearth. This was interpreted as a windbreak, or a similar temporary and open structure. Because posts overlap, and some cover the hearth itself, it appears to have been used and rebuilt multiple times (Riordan 2000).

Sandy Run: A total of 64 postholes were recorded at this site, which is located near the Wilson site. These postholes form two circular structures and one structure of undetermined shape, though probably rectangular. Each of the structures is approximately 4-4.5m in diameter. No hearths or large storage pits were uncovered; therefore, these structures were interpreted as abodes inhabited only during warm seasons (Riordan 2000).

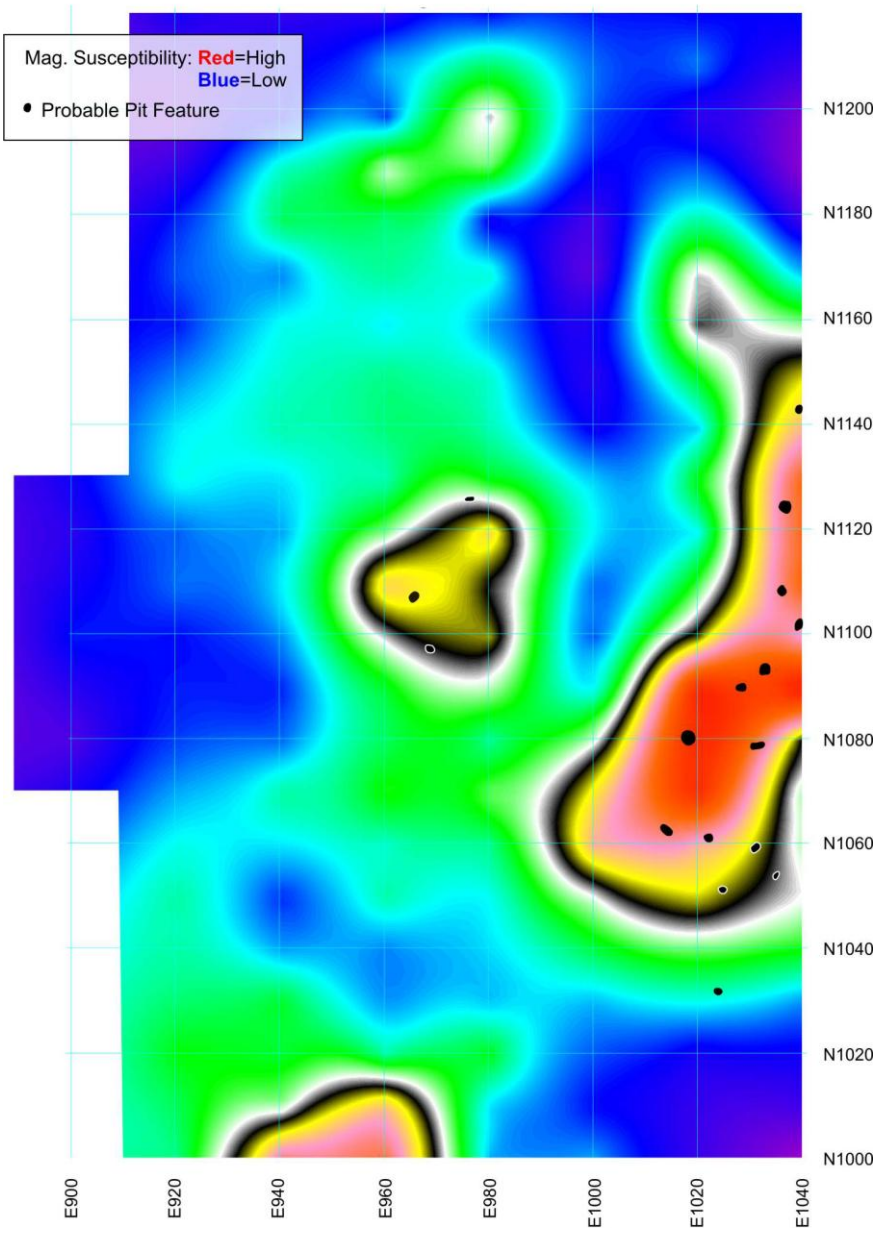
The purpose of providing these examples is to illustrate a small portion of the differing site layouts and contrasting functional interpretations of small Fort

Ancient sites. Seasonality is interpreted based on a different set of attributes at each site. The size of the structures serve as indicators in the case of the Goolman site (Turnbow et al. 1983), while the lack of storage pits and hearths at Sandy Run are used to reach a seasonal interpretation (Riordan 2000).

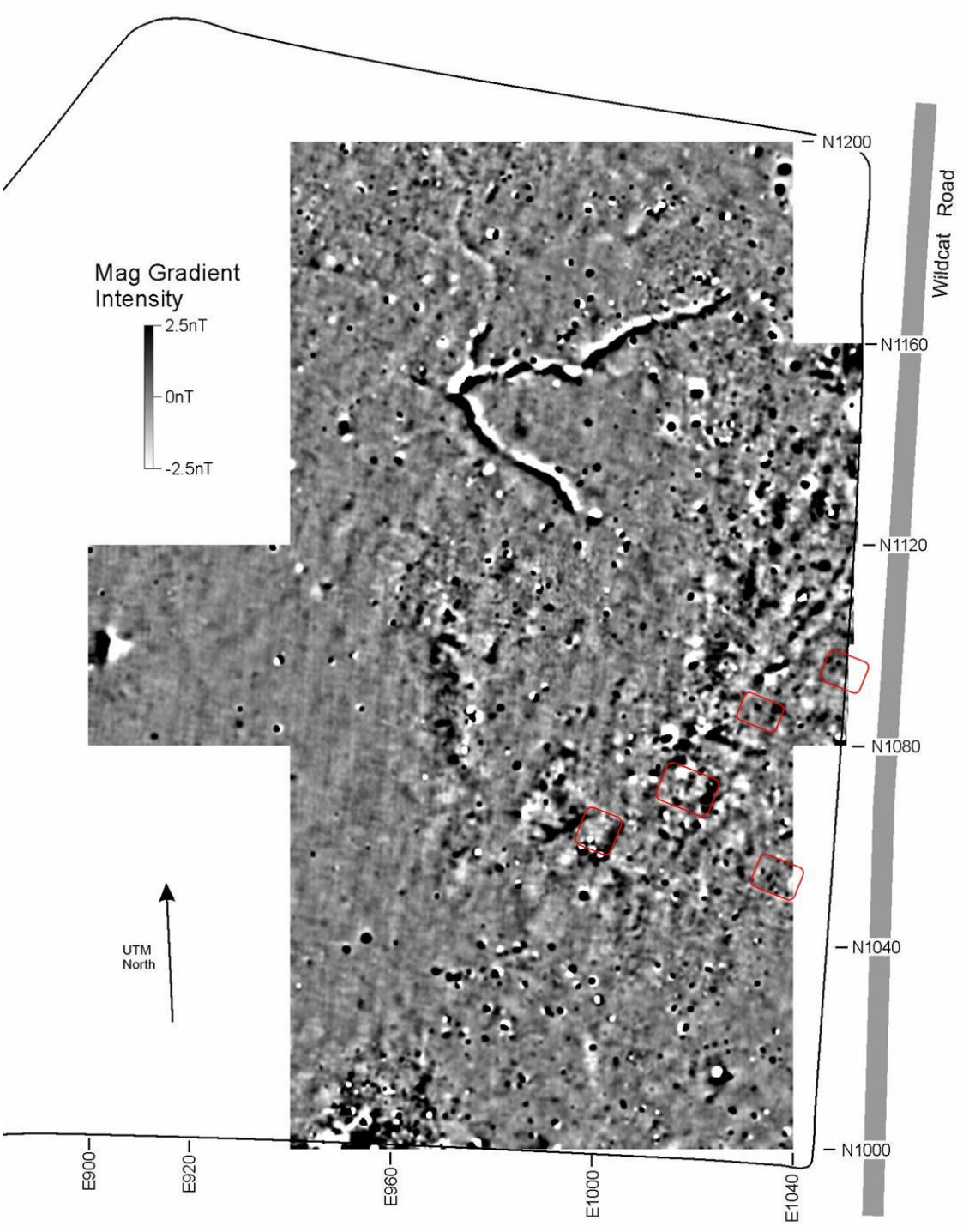
Introduction to the Wildcat Site

This study focuses on a small Fort Ancient site known as Wildcat, located near Dayton, Ohio. The site today rests to the west of a lively shopping center, and just north of an interstate highway. The Great Miami River flows 1.6km to the west of the site, and a creek located 200m away from the site serves as a nearby source of water.

The overall structure of the settlement has been discerned, on the basis of magnetic susceptibility and gradiometry (Figure 3) as well as intensive shovel testing and three years of excavation (Cook and Burks in press). The site consists of (1) a small residential district, based on the location of pottery and animal bone in the shovel tests, as well as the location of houses, pits, and burials; and (2) a smaller ritual zone (Cook and Burkes in press).


Mag. Susceptibility: Red=High
Blue=Low
Probable Pit Feature
N1200
N1180
N1160
N1140
N1120
N1100
N1080
N1060
N1040
N1020
N1000
E900
E920
E940
E960
E980
E1000
E1020
E1040

A)



B)

Figure 3: A) Magnetometry Data from Wildcat and B) with proposed structure locations (red outlines) (Source: Cook and Burks in press).

Anomalies in magnetic gradiometry readings often correspond with disturbances under the soil. High susceptibility most often results from areas indicating human activity such as midden or garbage deposits (Dalan 2008).

Jacob Deppen's (2008) previous research on white-tailed deer remains from Wildcat shows that there is no obvious evidence of seasonal difference in the exploitation of deer at the site. The deer bones analyzed constitute a large proportion of juveniles. This indicates that the site was used in warmer seasons, as white-tailed deer are born in the late spring, and these were no more than five months of age (Deppen 2008). Kristie Martin's (2009) analysis of paleobotanical remains adds further evidence that Wildcat was not seasonally occupied. The site contains no specific flora that would point to a seasonally-restricted inhabitance. However, plant storage for use during other seasons could skew the data. Hence, while not decisively ruling out the possibility, extant data offers no compelling reason to argue for a specific seasonal utilization of the site.

Methodology

The focus of the present study is to examine architectural variation at the Wildcat site. Data are from the 2007 and 2008 excavation seasons, the latter being when postholes were encountered in various parts of the residential area. This section describes methods for using architectural evidence to discern structure rebuilding as well as other chronological indicators.

Evidence pertinent to Fort Ancient architecture includes: postholes, floor stains, and wall daub remnants. Posthole patterning, depth, and diameter each reveal attributes of the structure. Evidence for structure rebuilding is most noticeable in the density of postholes, often recognizable as multiple rows of walls. Generally, a structure with a density of postholes per unit double that of other structures has been shown to have been rebuilt (Cook 2007). Ethnographic research and experimental reconstruction records the duration of similarly constructed houses to range from 5 to 15 years (McIntosh 1976; Cook 2005). The need to rebuild structures, therefore, indicates that the occupation of the site was of a longer duration than the life range of the buildings or a possible reuse of the site at a separate time period.

Radiocarbon dates from samples of carbon found at archaeological sites are a primary absolute dating technique. However, some artifacts are temporally diagnostic as well. Fort Ancient is characterized by small, triangular shaped projectile points, without notches or stems (Drooker 1997:82). The specific outlines of these triangular arrow points have been previously categorized into temporal classes, based on associated radiocarbon dates (Railey 1992). Six diagnostic types are commonly recognized. Type 2 projectile points display a flared base produced by concave or strait sides and a convex or straight base, and characterize Early Fort Ancient (A.D. 1000-1200). They are often delicate and well-made. Straight sides and base exemplify Type 5 which spans the Middle

and Late periods (A.D. 1200-1750), though is more prominent beginning around A.D. 1400. Type 4, a small point with convex sides and a straight or convex base, and Type 6, convex or straight sides with a concave base, are found most often after A.D. 1400. The concave based and sided Type 1 is difficult to place into a specific time period of Fort Ancient, as it occurs with less frequency than other types (Railey 1992) (Figure 4).

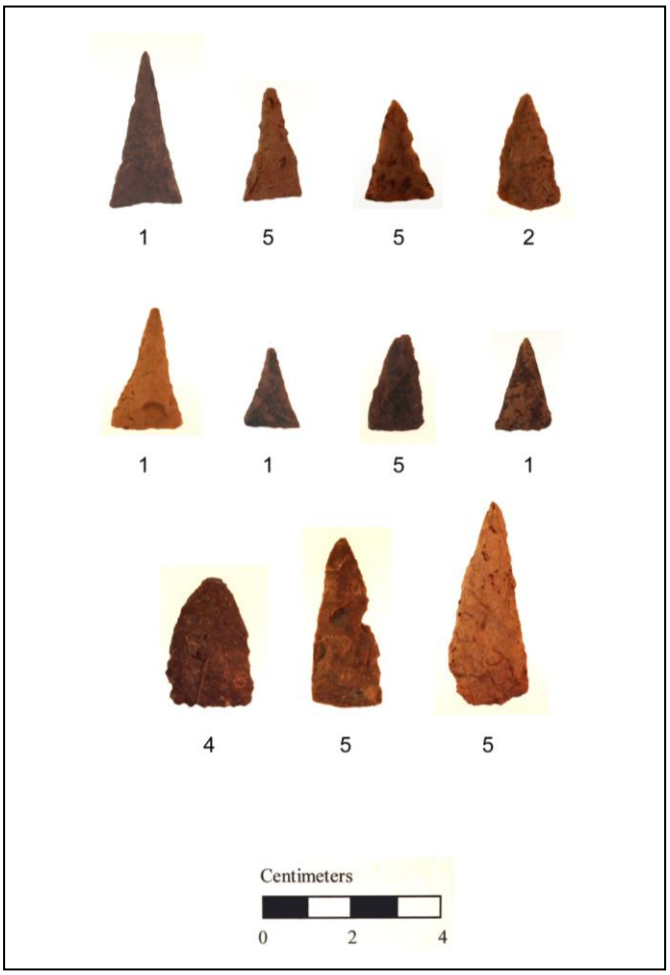


Figure 4: Fort Ancient diagnostic projectile points from the Wildcat site. Numbers correspond to Railey's (1992) point type designations.

Results at Wildcat

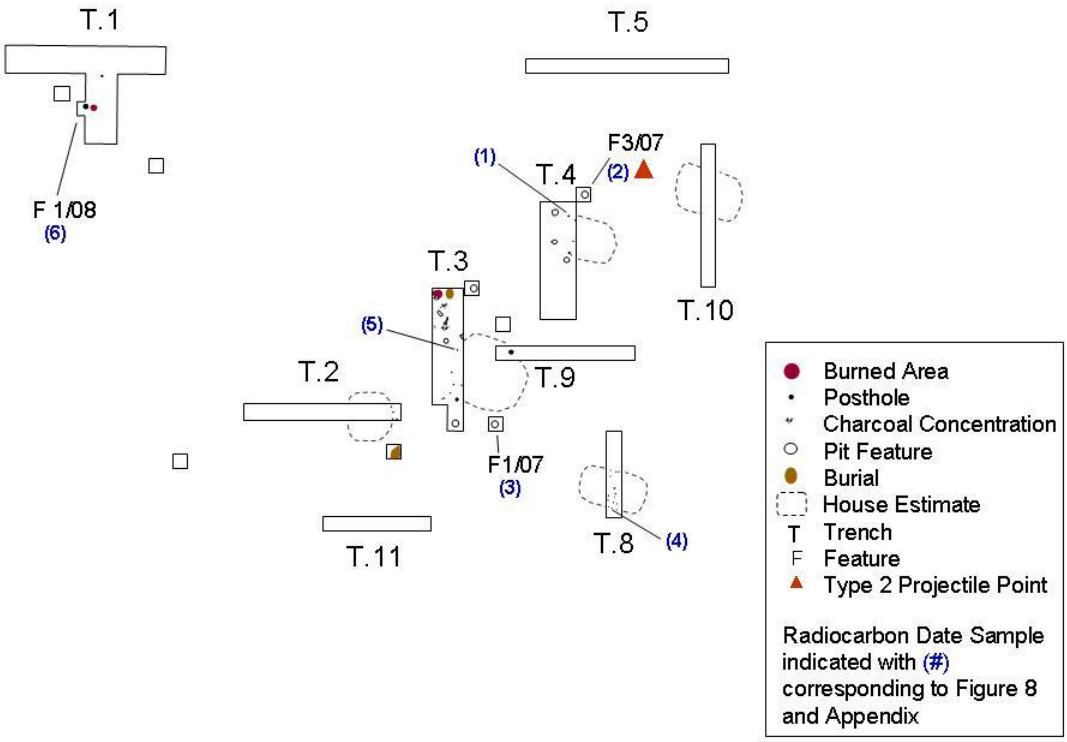


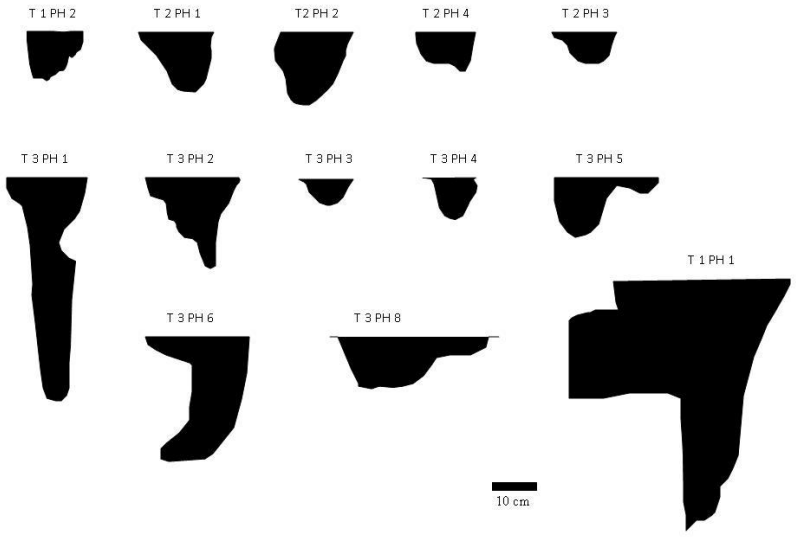
Figure 5: Wildcat Site Layout (after Cook and Burks in press)

Of the remains pertinent to architectural analysis, only postholes were identified at Wildcat. Unfortunately, there was a complete lack of daub and wall remnants from the site. Based on the gathered data, five structures are possible, along with one ritual pole, identified as cedar/hemlock wood by Martin (2009), the only occurrence at the site, located in the western portion of the site.

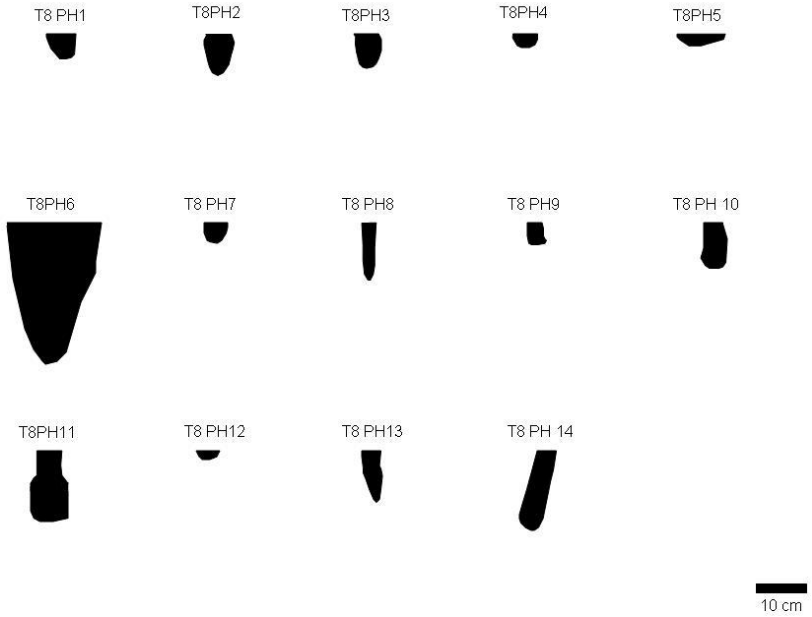
A total of 31 postholes were located. Posthole clusters were centered around Trenches 2, 3, 4, and 8. Trench 10 also likely contains part of a structure, based on

charcoal evidence in the plowzone. However, this trench was not excavated to the same depth as the others to preserve it for future study. Based on similar magnetic gradiometry patterns to other areas containing structural evidence, it is further argued that a structure is located there. Subsequently, these clusters will be referred to as House 2, 3, 4, 8, and 10 relative to their numbered trench location. Posthole diameters ranged from 4-41.5cm. The diameter of the solitary western post is nearly double those found in a structural context. Using a two sample T-test, the postholes located in Trench 8 were found to be significantly smaller in diameter than those located in the remaining trenches (11.59 [observed] > 4.81 [expected], DF = 30, $p<0.0001$). Depth averaged 17cm and ranged from 2-58cm (Figures 6 and 7). The extreme shallow depths from postholes encountered in Trench 8 may be due in part to erosion, given that this trench lies on ground which slopes downward from the east (Cook and Burks in press). Postholes located within clusters are evenly spaced. No area of significantly high density was found to indicate rebuilding of a wall. The majority of postholes appear to be vertically situated into the ground; however, some in Trench 8 have a slightly angled placement (Figure 6). This, coupled with the small size of the postholes and close spacing between them (36-68cm), could indicate the structure was of a flexed-pole construction (Reed 2007). Instead of a gabled roof affixed to vertical wall posts, a flexed-pole structure is built by assembling arching poles into a dome shape (Lacquement 2007). Thin, sapling

poles are flexible and would be suitable for this construction, corresponding to the small posthole size (Reed 2007).



A)



B)

Figure 6: Wildcat Posthole Profiles. A) Examples from Trenches 1, 2, & 3. B) Examples from Trench 8.

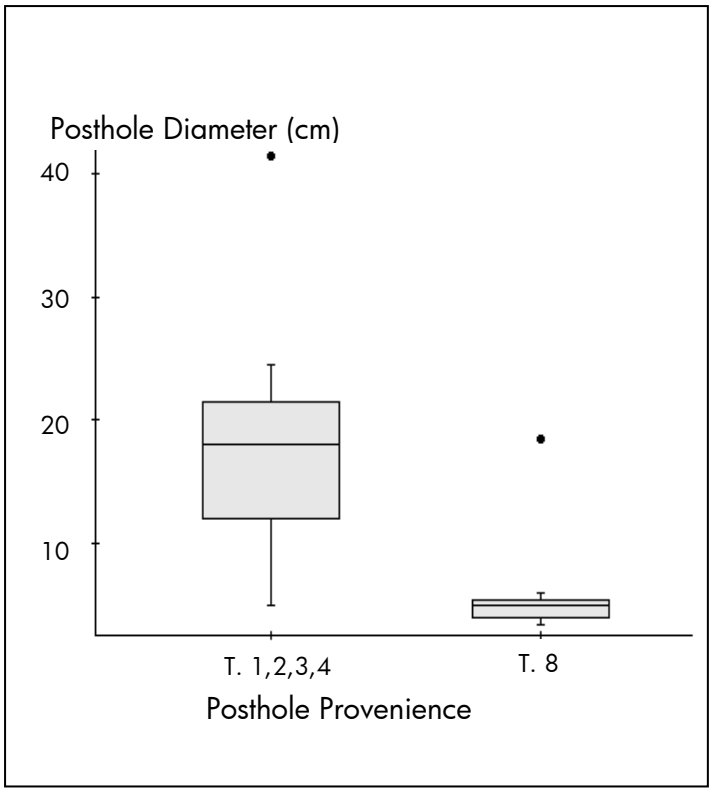


Figure 7: Box and whiskers plot comparing posthole diameters between Trenches 1, 2, 3, & 4 and Trench 8

A range of pits were uncovered in and around Trenches 3 and 4, and substantial burned areas were found in Trenches 1 and 3. Trench 3 contains two postholes located within an area of heavy charcoal concentration. This may indicate burning of a portion of the structure similar to Killen. Pit features seem to occur just outside the structures.

Six carbon samples from pit features (F. 3/07, 1/07, 1/08) and postholes (Tr. 3, 4, 8) were submitted for radiocarbon dating. According to a two-sigma calibration, mean dates found at Wildcat span from A.D. 1150-1500. The common average

age for four of the calculations lies around A.D. 1300-1350 (see Appendix). Radiocarbon dates overlap enough in the two-sigma range for a single occupation to be plausible; however, the range is great enough for two or three separate occupations to have occurred. If so, the structure in Trench 4 was constructed first, followed by simultaneously built structures in Trench 3 and 8. The western post (F. 1/08) produced the most recent date, indicating it was constructed late in the use of the site (Figure 8).

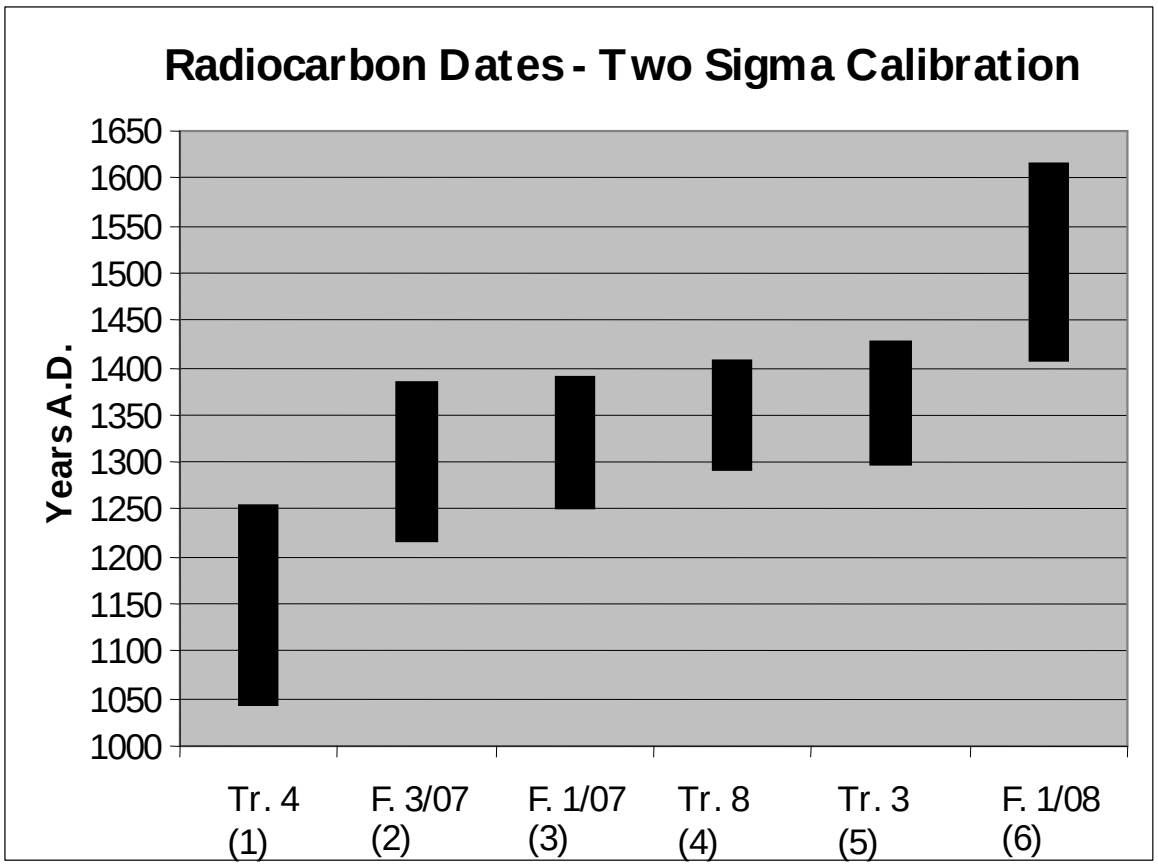


Figure 8: Wildcat Radiocarbon Date Ranges, Two Sigma Calibration

To further examine this possibility, the 25 diagnostic projectile points found at the site were examined in terms of spatial association to houses. Sixty percent of these fall into Type 5, characteristic of Middle to Late Fort Ancient periods. These Type 5 points were found associated with structures 3, 4, and 10. The only Type 2 point, correlating to Early Fort Ancient, was associated with structure 4, also the earliest radiocarbon date. Points of the Type 1 variety were located near Houses 3, 8, and 10, in addition to F. 1/08, the large post in the west (Figure 4). These data add further support that the settlement was reused or grew over time.

Conclusions

Excavation of Wildcat permitted architectural analysis of a small Fort Ancient site and substantiated the following conclusions: distinct house types are possible, similar to the Goolman site; the settlement could have developed or been reused over time; and it was composed of single-use houses. Significant differences in posthole diameter between House 8 and other structures indicate various modes of construction and function. Different type and size structures are evident at many other small sites leading to the belief that Structure 8 had a contrasting function to the other buildings at Wildcat, as it was not temporally different. Because the posts are smaller, it is possible that it was a less permanent structure, perhaps used in the warmer summer months when the majority of domestic activity would have taken place outdoors. Alternately, the more substantial structures may be interpreted as communal centers, while the less

permanent could have been simple sleeping quarters. The solitary western cedar/hemlock pole (Martin 2009) appears to be ceremonial in use.

As seen from the comparison of Wildcat to other small Fort Ancient sites, it is clear there is a great deal of variability. While they are sometimes overlooked in favor of larger settlements, the divergences in site layout and function among the small sites reveals a degree of variation which has yet to be neatly categorized or fully explained. Unlike the Goolman, Wilson, or Sandy Run sites, Wildcat does not appear to be purely a seasonal or specific-utilization camp. This is based in part on previous faunal and floral analysis. Additionally, storage and refuse pits occur outside the structures, perhaps reducing the likelihood of indoor activity found mainly in winter months. However, evidence of storage pits themselves, and structures falling in the larger range of floor space when compared to the other sites mentioned, could point to winter usage. In other words, evidence exists which can be interpreted in multiple manners, a testament to the equifinal nature of much archaeological data. Relatively large structures with multiple associated storage and refuse pits implies the site was used long enough to justify a substantial amount of construction effort. The absence of a palisade may also be significant on this front: the site was not so large or populated that protection was deemed necessary, or worth the effort of raising such defensive structures.

The early radiocarbon date from House 4, along with the Type 2 triangular point, suggests this structure pre-dated the others. Expansion of the settlement with additional housing, and finally a ritual pole to the west, most likely occurred due to a growing number of occupants. The lateral outward growth and the homogeneity of artifacts throughout the site suggests a lineage or kin group inhabited the area. However, there was no evidence of rebuilding at the Wildcat site which would be manifest had the residents remained in place long enough for their wooden houses to decay. Therefore, a reuse of the site after an extended period away is suggested, which would also concur with the wide range of radiocarbon dates. Also, the relatively widened diameter of some of the postholes at the surface could be explained by the action of pulling the posts out of the ground. If residents left the site before the wood had decayed, it might have been beneficial to carry the material with them for later reuse. Though the inhabitants may not have stayed at the site long enough to require rebuilding of structures, evidence of two burials amid the residential area suggests that they did remain a substantial length of time.

It appears that Wildcat contained all the necessities of a self sufficient site, coupled with the fact that it does not seem to have been inhabited purely seasonally. It seems highly probable that some sort of relationship would have existed between the inhabitants of Wildcat and nearby larger sites such as SunWatch. Whether the inhabitants were a mobile faction of a larger village or an

autonomous group cannot be determined at this time. Further study could be made into differentiating the specific structures found at the Wildcat site and the site's overall temporal and social relationship to SunWatch and other sites in the region.

References Cited

Baby, Raymond S.
1971 Prehistoric Architecture: A Study of House Types in the Ohio Valley. *The Ohio Journal of Science* 71(4):193-198.

Brose, David S.
1982 The Archaeological Investigation of a Fort Ancient Community Near Ohio Brush Creek, Adams County, Ohio. *Kirtlandia* 34:1-69.

Brose, David S., Donald Bier, Jr., Judith Astramecki, Fredrick Chapman, Richard Mensforth, David Morse, and Paul Storch
1979 The Fort Ancient Occupation of the Killen Ridge, Adams County, Ohio. *Archaeological Research Report* 20:11-479. Cleveland Museum of Natural History, Cleveland.

Brose, David S. and Nancy M. White
1983 Recent Data on Fort Ancient Occupation in the Caesar Creek Valley, Southwestern Ohio. *West Virginia Archaeologist* 35(2):3-26.

Cook, Robert A.
2005 Reconstructing Perishable Architecture: Prospects and Limitations of a Fort Ancient Example. *North American Archaeologist* 26(4):357-388.

2007 Single Component Sites with Long Sequences of Radiocarbon Dates: The SunWatch Site and Middle Fort Ancient Village Growth. *American Antiquity* 72(3):439-460.

2008 *SunWatch: Fort Ancient Development in the Mississippian World*. The University of Alabama Press, Tuscaloosa.

Cook, Robert A. and Jarrod Burks
In press Determining Site Size and Structure: A Fort Ancient Example. *American Antiquity*.

Cowan, C. Wesley
1987 *First Farmers of the Middle Ohio Valley: Fort Ancient Societies, A.D. 1000-1670*. Cincinnati Museum of Natural History, Cincinnati, Ohio.

Dalan, Rinita A.
2008 A Review of the Role of Magnetic Susceptibility in Archaeogeophysical Studies in the USA: Recent Developments and Prospects. *Archaeological Prospection* 15(1):1-31.

Deppen, Jacob
2008 *Seasonal Mobility and Environmental Stress in an Archaeological Context: Analysis of Deer Remains from Three Fort Ancient Sites in Dayton, Ohio*. Senior Honors Thesis, The Ohio State University, Columbus.

Drooker, Penelope B.
1997 *The View from Madisonville: Protohistoric Western Fort Ancient Interaction Patterns*. Museum of Anthropology, Memoirs No. 31, University of Michigan, Ann Arbor.

Drooker, Penelope B. and C. Wesley Cowan
2001 Transformation of the Fort Ancient Cultures of the Central Ohio Valley. In *Societies in Eclipse: Archaeology of the Eastern Woodlands Indians, A.D. 1400-1700*, edited by David S. Brose, C. Wesley Cowan, and Robert C. Mainfort, pp. 83-106. Smithsonian Institution Press, Washington, D.C.

Essenpreis, Patricia S.
1978 Fort Ancient Settlement: Differential Response at a Mississippian-Late Woodland Interface. In *Mississippian Settlement Patterns*, edited by Bruce D. Smith, pp. 143-167. Academic Press, New York.

Griffin, James B.
1943 *The Fort Ancient Aspect*. University of Michigan, Ann Arbor.

Henderson, A. Gwynn, and David Pollack
2001 Fort Ancient. In *Encyclopedia of Prehistory, Volume 6*. Edited by Peter N. Peregrine and Melvin Ember. New York: Kluwer Academic/Plenum Publishers, 171-194.

Heilman, James M., Duane C. Anderson, and Christopher Turnbow
1990 Exploring Fort Ancient Culture: Dayton's Prehistoric Indian Village. *Museum Anthropology* 14:17-20.

Heilman, James M. and Roger R. Hoefer
1981 Possible Astronomical Alignments in a Fort Ancient Settlement at the Incinerator Site in Dayton, Ohio. In *Archaeoastronomy in the Americas*, edited by Ray Williamson, pp. 157-171. Ballena Press, Los Altos, California.

Kennedy, William Edward
2000 *Interpreting Fort Ancient Settlement Variability*. M.A. Thesis, Kent State University, Kent, Ohio.

Lacquement, Cameron H.
2007 Introduction to Architectural Variability in the Southeast. In *Architectural Variability in the Southeast*, edited by Cameron H. Lacquement, pp. 1-12. University of Alabama Press, Tuscaloosa.

Ledbetter, R. Gerald and Lisa D. O'Steen
1992 The Grayson Site: Late Archaic and Late Woodland Occupations in the Little Sandy Drainage. In *Current Archaeological Research in Kentucky: Volume Two,* edited by David Pollack and A. Gwynn Henderson. Kentucky Heritage Council, Frankfort.

Martin, Kristie
2009 *Eastern Agricultural Complex Traditions in Small Fort Ancient Communities – The Wildcat Example*. M.A. Thesis, The Ohio State University, Columbus.

McIntosh, R. J.
1976 Square Huts in Round Concepts. *Archaeology* 29: 92-101.

Pauketat, Timothy R., and Susan M. Alt.
2005 Agency in a Postmold? Physicality and the Archaeology of Culture-Making. *Journal of Archaeological Method and Theory* 12(3):213-236.

Pollack, David, and A. Gwynn Henderson
1992 Toward a Model of Fort Ancient Society. In *Fort Ancient Cultural Dynamics in the Middle Ohio Valley,* edited by A. G. Henderson, pp. 281-294. Monographs in World Archaeology No.8. Prehistory Press, Madison, Wisconsin.

Railey, James A.
1992 Chipped Stone Artifacts. In *Fort Ancient Cultural Dynamics in the Middle Ohio Valley*, edited by A. Gwynn Henderson, pp. 137-169. Monographs in World Archaeology No. 8. Prehistory Press, Madison, Wisconsin.

Reed, Nelson A.
2007 Evidence of Curved Roof Construction in Mississippian Structures. In *Architectural Variability in the Southeast*, edited by Cameron H. Lacquement, pp. 12-30. University of Alabama Press, Tuscaloosa.

Riordan, Robert
2000 Peas in a Pod? Diversity at Small Late Prehistoric Components in Southwest Ohio. In *Cultures Before Contact: The Late Prehistory of Ohio and*

Surrounding Regions, edited by Robert A. Genheimer, pp. 404-424. The Ohio Archaeological Council, Columbus.

Sharp, William E.
1996 Fort Ancient Farmers. In *Kentucky Archaeology*, edited by R. Barry Lewis, pp. 161-182. The University Press of Kentucky, Lexington.

Simonelli, Lynn M., and William Kennedy
2003 "My Other Site is a National Historic Landmark": Current Research at the Late Prehistoric Wegerzyn Garden Center Site (33My127). Paper presented at the 2003 Annual Meeting of the Society for American Archaeology.

Turnbow, Christopher A. and Cynthia E. Jobe
1984 The Goolman Site: A Late Fort Ancient Winter Encampment in Clark County, Kentucky. In *Late Prehistoric Research in Kentucky*, edited by D. Pollack, C. D. Hockensmith and T. N. Sanders, pp. 25-48. Kentucky Heritage Council, Frankfort.

Turnbow, Christopher A., Cynthia E. Jobe, Nancy O'Malley, Dee Ann Wymer, Michelle Seme, and Irvin Rovner
1983 *Archaeological Investigations of the Goolman, Devary, and Stone Sites in Clark County, Kentucky*. Archaeological Report No. 78. Department of Anthropology, University of Kentucky, Lexington.

Appendix

Radiocarbon Dating Results

Number	Associated House No.	BETA	Provinience	Service	Material	Measured Age	Conventional Age	2 Sigma Calibration
(1)	4	248702	33MY499 TR.4 PH #1 L. 2 (5-10 cm)	AMS	wood charcoal	870 +/- 40 BP	860 +/- 40 BP	Cal AD 1040 to 1100 (Cal BP 910 to 850),Cal AD 1120 to 1260 (Cal BP 830 to 690)
(2)	4	235034	33MY499 F.3/07 60-69cm	AMS	wood charcoal	730 +/- 40 BP	720 +/- 40 BP	Cal AD 1240 to 1300 (Cal BP 700 to 650),Cal AD 1370 to 1380 (Cal BP 580 to 570)
(3)	3	235033	33MY499 F.1/07 20-25cm	AMS	wood charcoal	700 +/- 40 BP	690 +/- 40 BP	Cal AD 1260 to 1320 (Cal BP 690 to 630),Cal AD 1350 to 1390 (Cal BP 600 to 560)
(4)	8	248703	33MY499 TR.8 PH # 13 L.2 (5-10 cm)	AMS	wood charcoal	610 +/- 40 BP	610 +/- 40 BP	Cal AD 1290 to 1420 (Cal BP 660 to 540)
(5)	3	248701	33MY499 TR.3 PH #1 L. 5 (20-25 cm)	AMS	wood charcoal	570 +/- 40 BP	590 +/- 40 BP	Cal AD 1290 to 1420 (Cal BP 660 to 530)
(6)	N/A (Ritual Pole)	246085	33MY499 F1-08 level 22-36cm	AMS	wood charcoal	450 +/- 40 BP	440 +/- 40 BP	Cal AD 1420 to 1490 (Cal BP 530 to 460)